CALTECH

Ec 11 Final Examination
Professor R. Preston McAfee
Winter 2007

Instructions: Open book, open notes, calculators and computers are OK for computations or to read class materials, no collaboration.
Partial credit will be assigned. Please show your work.
You may take this test during any consecutive 4 hour period.
Due March 14 by 4PM. Please deposit in Box outside Baxter 111.

1. (15%) A company is evaluating a project with a start-up fee of $50,000, but pays $2,000 every second year, starting two years from now. Suppose the company is indifferent about taking on the project or not. What discount rate is the company using?

2. (21%) The market for Satellite Radio consists of only two firms. Suppose the market demand is given by:

$$P = 250 - Q$$

Where P is the price and Q is the total quantity, so $Q = Q_1 + Q_2$. Each firm has total costs given by:

$$C(Q_i) = Q_i^2 + 5\,Q_i + 200$$

a) What is the market price predicted by the Cournot duopoly model?
b) If the industry produces a total quantity X, what allocation of quantity (with $X = Q_1 + Q_2$) between the two companies minimizes total cost? (Your answer should express total cost as a function of X.)
c) If the firms merge with the cost found in b), what is the market price?

3. (15%) Consider a market for a commodity that can be stored with zero cost from winter to summer but cannot be stored from summer to winter. The winter demand and supply are $Q_w^d = 50 - 2\,P_w$ and $Q_w^s = 3\,P_w$ and the summer demand and supply are $Q_s^d = 100 - 3\,P_s$ and $Q_s^s = P_s$. Compute P_w, P_s, Q_w, Q_s and the amount of hoarding from winter to summer. (Set discounting to zero.)

4. (15%) A consumer has utility $u(x) = x^{7/8}$ and a base wealth of $100,000. She is about to take part in a gamble that will give her $10,000 (bringing her to $110,000) if a fair die rolls less than 3 (probability 1/3), but will cost her $5000 (leaving her with $95,000) otherwise.
    a. What is the certainty equivalent of participating in this gamble?
    b. How much would she be willing to pay to not have to take this gamble?

5. (10%) Find all equilibria of the following game:

	Column	
	Heads	Tails
Heads	(2, -1)	(-2, 3)
Tails	(-2, 2)	(1, -2)

Row

(8% each) The following questions can be adequately answered with short answers, no more than two or three lines.

6. Explain the advantages of tradable permits over Pigouvian taxes or quotas.
7. In auctions where bidders are buyers, does the expected price rise the more the price is linked to the actual value? Why?
8. Discuss disadvantages of vertical mergers.